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ABSTRACT

Welfare reform efforts have been based on crucial assumption: single mothers moving off of AFDC and into the work force will be able to find affordable child care. Two parallel studies of child care supply and its distribution across rich and poor communities inform the debate over child-care availability. In the first study, data from 100 counties nationwide were analyzed to ascertain the differences in preschool availability per child, and multivariate models were constructed to identify factors that influence sharp variation in child-care supply. Findings revealed uneven distribution of child-care supply across regions of the country and local communities. Factors that contribute to these disparities include affluence and education of parents, and family preferences and patterns of expressed demand. The second study analyzed data similar to those of the first study from 368 smaller communities in Massachusetts, including neighborhoods with high concentrations of families on welfare and single-parent households. Findings revealed that targeting welfare benefits to low-income neighborhoods has spurred greater child care availability. Yet, working-class and middle-income communities and those with greater shares of single-parent families still display lower levels of child-care availability than wealthier communities; and providers tend to respond to demands of highly educated parents for more preschooling by raising supply in their affluent communities. The primary policy implication arising from these studies is the need to target resources to help equalize child care access. (BAC)

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Can Poor Families Find Child Care?

Persisting Inequality Nationwide and in Massachusetts

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Can Poor Families Find Child Care?
Persisting Inequality Nationwide and in Massachusetts

Summary

Welfare reform advocates, eager to move AFDC recipients back into the workforce, make one crucial assumption: single mothers will be able to find affordable child care for their young children. Almost two-thirds of all households receiving AFDC benefits nationwide include a preschool-age child. If a greater proportion of these mothers are nudged into a job -- as required by White House and congressional welfare proposals -- a large number of additional child-care slots will be required.

Will hundreds of thousands of mothers be able to find affordable child care within their impoverished neighborhoods? Are preschool programs equitably distributed across poor and affluent communities? If access to child care is insufficient or unfairly distributed, welfare reform simply will fail to move single mothers back into the workforce. Disparities in supply also will further disadvantage poor children who may be developmentally behind their more affluent peers -- even before they begin school. Little evidence has been available on the supply and distribution of child-care programs. It is this knowledge gap that the two studies reported below help to fill.

Nationwide Inequality in Child Care Availability

Earlier we documented how the per capita supply of preschool programs varies markedly between rich and poor counties nationwide. Availability per capita ranges from two to three times higher in affluent counties, relative to local areas populated primarily by rural poor or urban working-class families.

The following paper provides two additional findings regarding nationwide patterns, not known when we published the earlier report:

- A local county's economic vitality, average family income, and parents' education levels are the strongest determinants of child-care availability overall. The share of affluent families with preschool-age children who enroll their child in a formal program equals 80 percent, versus about half of all low and middle-income families.

  The supply of *subsidized child-care centers*, however, is roughly equal across low and high-income counties. Government subsidies targeted on low-income communities have helped to equalize child-care supply for the poor.

- This good news is dampened by the fact that uneven federal and state subsidies (a) fail to off-set supply inequalities linked to market forces, particularly disproportionate gains in supply seen in affluent communities where parental demand and family resources are strong, and (b) reinforce persisting inequities across states and regions of the country. Child care availability in the Northeast, for example, is almost twice as high relative to the West (28.7 classrooms for preschoolers per 1,000 children, versus just 14.9 classes, respectively). Some of this difference is attributable to the lower propensity of Latino families to utilize formal preschools. Sixty percent of the nation's Latino population resides in Western states.

Child Care Inequality Inside Poor Communities

Beneath county regions lay smaller neighborhoods that vary in terms of their economic and demographic characteristics, and the relative availability of child care and preschool programs. Welfare recipients, for example, reside in poor pockets of large and diverse counties. Affluent neighborhoods with robust preschool markets exist side-by-side with poor communities. In the second study we focus on disparities in child-care supply among 368 smaller communities, defined by zipcode boundaries, within the state of Massachusetts.

Has Massachusetts -- a state historically committed to expanding and equalizing access to child care -- in fact reduced inequities faced by poor families? Massachusetts spends more per capita on child care than any other state in the nation. It provides a good case for assessing whether state government action can bring about greater equity.

If pro-preschool states fail to provide sufficient child care spaces for welfare recipients, successful implementation of workfare requirements will be severely hampered. Reform proponents are expressing enormous faith in block-grants and states' ability to improve welfare programs. But will state-level action reduce these sharp nationwide disparities in which families have access to child-care centers and preschools? And will less affluent states have the political will and fiscal resources to bring child-care supplies up to the nationwide average?

Major findings from the Massachusetts neighborhood study:

- Families in Massachusetts benefit from a much greater supply of child-care organizations than is available to parents nationwide. In Massachusetts, communities dominated by middle-income families have 10.3 child-care centers operating versus 5.7 in the average county nationwide.

- Despite Massachusetts's progressive child-care policies, the number of preschool places available to poor families is almost one-third below that found in affluent suburban communities. This gap is even wider if we look at neighborhoods with high

proportions of residents receiving welfare benefits. Supply also is lower in communities with high proportions of single parents, including not only welfare recipients.

- Availability remains low in many working-class and middle-income neighborhoods. In Massachusetts the number of child-care slots in these communities is 40 percent below the mean number of spaces found in affluent local areas.

- Neighborhoods with high proportions of non-English speaking Latino families possess a lower supply of child-care slots. This may stem from lower family demand or from less attention paid by government to the preschool needs of poor Latinos.

- Parents' education levels are more influential in sparking demand for and supply of child-care places than is family income. Per capita preschool supply is fully 50 percent greater in neighborhoods with highly educated parents, relative to communities dominated by poorly educated families.

Policy Implications

These findings are hopeful in revealing some success in equalizing the availability of child care and preschools across rich and poor neighborhoods -- but only when state government acts aggressively over time to reduce inequalities. Most states lag far behind Massachusetts in this regard. If Washington's role in targeting child care benefits on those most in need is eroded -- advocated by supporters of block-grants to the states -- it is unlikely that persisting inequalities will be reduced. The early development and school performance of children in less affluent states will continue to lag behind urban states that invest more heavily in preschool organizations.

Relatively low supplies of child care in poor communities -- observed even in the progressive Massachusetts policy environment -- suggest that current welfare reform proposals will not likely move substantial numbers of single mothers back into the workforce. Even President Clinton's modest proposal to expand preschool services for welfare recipients would support only 100,000 new child slots per year -- covering just 3% of all AFDC recipients with preschool-age children.

This report confirms earlier findings that working-poor and working-class families experience particularly low child-care supplies in many areas. The 1990 child care block-grant program earmarked preschool aid to these families for the first time. Here too, the Congress's earlier commitment to *target* scarce resources on families with limited access and household resources was an important ingredient of this legislation. Few state governments have exhibited the will or have possessed sufficient resources to reduce poor families' unequal access to child care.

Introduction: Can Poor and Working-Class Families Find Child Care?

The preschool and child-care enterprise, expanding rapidly over the last three decades, has become a diverse mixed-market of 80,000 local organizations serving over 4 million young children nationwide (Kisker, Hofferth, Phillips, & Farquhar, 1991). Women's rising workforce participation has contributed to demand for preschool organizations: the proportion of mothers with children under age 6, who are employed, climbed from 14% in 1950, to 58% in 1990 (Hofferth, 1989). Policy concern for children's early development also has influenced growth in preschool supply, including rising spending on Head Start, family support, and state-funded child-care programs. Federal and state governments now allocate over $6 billion to the child-care and preschool sector, via welfare benefits, tax credits, parental vouchers, and direct subsidies to preschool providers (Barnett, 1992; Blau, 1993; General Accounting Office, 1993; *Report*, 1994).[1]

The current debate over welfare reform reveals how little we know about the availability and distribution of child-care programs, particularly within impoverished and working-class communities. The desire to reduce single mothers' dependence upon AFDC and related welfare programs is admirable. But the pragmatic success of any reform rests on the ability of these low-income women to find affordable child care. Sixty-five percent of the nation's 4.5 million households currently receiving AFDC include preschool-age children. If the supply of child-care programs is insufficient in poor neighborhoods, these mothers will not be able to leave home and enter the workforce. Similarly, the ability of working-poor parents to remain employed and off the welfare rolls depends upon access to preschool services in their local communities. Little evidence has been available to substantiate whether local child-care supplies are adequate and equitably distributed.

Child-care activists often argue that preschool supply is insufficient and that access is unequally distributed. Some evidence does back this claim, at least for poor communities in rural and innercity areas. For example, one study found that several zipcode-defined communities in innercity Chicago had *no* preschools available for young children, despite relatively high availability for Cook County overall (Siegel & Loman, 1991). In response to such findings support for expanding the preschool "system" has grown. President Clinton has adopted the clarion call to "fully fund Head Start," that is, to ensure that a space is available for every eligible young child. Congressional action on the Elementary and Secondary Education Act (ESEA Title I) in 1994 included a new set-aside to support preschools in the public schools, stemming from interest in boosting "school readiness" of impoverished children. Tax credits to working-poor families -- households with an employed parent but still living close to the poverty line -- have expanded to $5 billion in annual tax spending since 1990 (Fuller & Holloway, 1995).

Other recent studies, however, suggest that preschool supply may be sufficient in many communities, given current family preferences and demand patterns. A recent national study of child-care supply found that licensed capacity exceeds enrollments in some areas (Willer, Hofferth, Kisker, Hawkins, Farquhar, & Glantz, 1991). Earlier evidence from three cities found that preschool programs were operating at 92% of capacity (Kisker, Maynard, Gordon, & Strain, 1989). This margin of under-utilization, of course, would evaporate in poor areas if just a fraction of welfare mothers returned to work and demanded child-care slots.

This paper informs the debate over child-care availability, reporting on two parallel studies of supply and its distribution across rich and poor communities. First, we analyze data from 100 counties nationwide, focusing on wide differences in per child availability and identifying aggregate economic and demographic factors that help to explain this variation. Second, we analyze similar data on 368 smaller communities in Massachusetts, including neighborhoods with high concentrations of families on welfare and single-parent households. Reporting on these tandem studies shows how the degree of inequality in child-care availability is linked to income and educational levels of parents, as well as being conditioned by the policy environment. Even within a progressive policy environment -- as found in Massachusetts -- significant inequalities persist for low-income and working-class families. These relatively low levels of child-care supply will constrain the implementation of welfare reforms aimed at putting single mothers back to work.

FAMILY DEMAND FOR AND ACCESS TO CHILD-CARE: WHAT DO WE ALREADY KNOW?

Research at two levels has been conducted to inform the related questions of whether child-care availability is sufficient *and* equitably distributed across affluent and poor communities. First, we review studies that focus on preschool *organizations* and where they are more likely located, including economic and demographic features of their context, which families they serve, and levels of under-utilized capacity. Second, economists and demographers have focused on variation in preschool participation among individual *families* which differ in their economic and demographic attributes.

Organization-level Studies

Research at aggregate or organizational levels is exemplified by the 1990 national study of child-care supply. Willer et al. (1991), in part, examined whether sampled preschools, operating in 100 counties, were filled to their licensed capacity, finding unused child spaces in some local areas. Availability also appeared to be higher in the Northeast

and South, according to estimates based on sample data from the same study (Kisker et al., 1991).[2] These region-level estimates are sensitive to data utilized, the sorting of states into regions, and weighting methods, as detailed below.

Other analysts point out how neighborhood-level inequities can be masked by looking across big units, such as geographical regions or counties. Siegel and Loman (1991), for instance, found that several zipcode-defined communities in innercity Chicago had *no* child-care centers available for young children despite relatively high availability in Cook County overall.

Stemming from their study of centers in five cities, Whitebook, Howes, and Phillips (1989) found that working-class and middle-income families were under-represented among families using formal preschools and paid a larger share of their income for child care (compared to low-income and affluent families), given that they were ineligible for subsidies. Similar findings on the distribution of preschool quality are reported by Phillips, Voran, Kisker, Howes, & Whitebook (1994). We follow-up on this finding, assessing whether curvilinear relationships exist between family income and child-care access: relatively high enrollment rates for poor and affluent families and lower utilization among working-class households.

Family-level Studies

The second analytic approach is to survey families and assess which types of households display a higher or lower propensity to participate in child-care programs. This helps to determine the degree of equity with which preschool programs are accessible across diverse local communities. Two important findings have emerged from this line of research. First, parents' employment and economic status are related to preschool utilization, although again, not always in a linear manner. For example, utilization rates appear to be fairly constant for households with preschool-age children and incomes ranging from less than $10,000 (of which 45% use centers and preschools) to those earning $30,000-$40,000 (of which 53% use preschools; West, Hausken, & Collins, 1993). But within selected ethnic groups and in some areas, working-class families may utilize preschools at a lower rate than do subsidized low-income or affluent families.

While maternal employment status is highly related to using nonparental child care in general, many families with *unemployed* mothers utilize preschools (44 percent; Hofferth, Brayfield, Deich, & Holcomb, 1991). This includes middle-class and affluent households where the husband is the primary wage earner.

Second, household-level studies point to demographic factors that contribute to variation in aggregate local availability. For example, African-American families utilize formal child-care programs at higher rates at most levels of family income; Latinos use preschools less, relative to whites and blacks (Becerra & Chi, 1992; West et al., 1993). A portion of these inter-ethnic differences correspond to mean differences in maternal education and to the higher proportion of single-parent households found in most black communities (Hofferth et al., 1994).

Single-mothers residing in poor communities often cite unavailable or unstable child-care arrangements as the principal reason for staying on AFDC. While young welfare recipients rely heavily on kin members and friends for child care, many report a preference for instead placing their child in a preschool or center-based program *if* they could find one (Kisker & Silverberg, 1991; Siegel & Loman, 1991; Meyers, 1993).

The availability of fathers and proximate kin members to care for young children is clearly related to preschool utilization (Heckman, 1974; Leibowitz, Waite, & Witsberger, 1988). The age of youngsters also makes a large difference: preschool utilization rises as children approach age 3 or 4 (Hofferth et al., 1991). Parents variably express concern with quality, and this is related to the choice of a center-based program (Hofferth & Wissoker, 1992). The meaning of "quality," however, varies among ethnic groups, social classes, and individual families (Holloway & Fuller, 1992).

STUDY 1: NATIONWIDE VARIATION IN CHILD-CARE AVAILABILITY AMONG LOCAL COUNTIES

In Study 1 we detail the basic distribution of preschool availability across geographic regions and local counties. Then, we construct multivariate models to identify factors that influence sharp variation in child-care supply observed nationwide among 100 sampled counties.

Data and Method of Estimation

In the late 1980s, Mathematica Policy Research began work on a sampling frame to randomly draw a representative set of licensed child-care centers. After stratifying all counties in the United States on the basis of urbanization, Kisker et al. (1991) selected 100 primary sampling units (PSUs), including instances where small counties were clustered together into a single PSU. The 20 most populated urban counties were selected *a priori*,

followed by random selection of 80 PSUs falling within the four strata linked to urbanization levels. Complete lists of all licensed and otherwise known preschool organizations then were built, working with local informants in each of the 100 PSUs (simply called, *counties*). Since the probability of drawing a county in each stratum is known, the inverse of these probabilities can be used as sample weights to make regional estimates of per capita preschool supply. Thus an unprecedented data set became available on the entire universe of child-care centers and preschools within each of the 100 counties.[3]

County-level Differences in Preschool Availability

Table 1 displays four basic indicators of preschool availability for affluent and low-income counties.* The 100 sampled counties were ranked from highest to lowest by their mean household income levels, then split into quartiles.[4] The first row of Table 1 shows our estimate that 6.1 preschool organizations (per 1,000 children, age 3-5) are available within the wealthiest quartile of counties, on average. This compares to 5.0 child-care organizations in the poorest quartile. The gap is wider if we look at a second indicator of availability: the number of preschool classes operating within these counties. Looking just at class-groups serving children age 3-5 years-old, high-income counties contain 22.0 class-groups, versus 13.4 in low-income counties.

Importantly, the availability of *subsidized* organizations does not differ between high and low-income counties overall, estimated at 1.8 subsidized preschools for both groups (including centers operated by Head Start, public schools, and non-profits financed from public monies). Note that many subsidized centers can operate in high-income counties that have pockets of poor families. We did not observe any differences in two common indicators of preschool quality: the ratio of children to credentialed teachers and the ratio of children to all adult staff. This is consistent with the recent finding that targeted federal subsidies have helped to equalize child-care quality, at least in terms of these typical indicators (Fuller, Raudenbush, Wei, & Holloway, 1993; Phillips et al., 1994). We do find that centers and preschools in high-income counties tend to be larger in terms of more classes, compared to low-income counties (4.4 versus 3.4 class-groups, respectively).

Table 1 also reports on economic and social facets of these counties, several of which covary with preschool availability. Counties in the South and rural Midwest are over-represented within the lowest quartile, explaining why poverty levels are so different:

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* All tables and graphs appear at the back of the report.

13.9% of all households are below the poverty line, versus just 6.6% in the highest quartile of counties. Affluent counties, more urban overall, display vibrant labor markets with twice the share of jobs in professional and technical sectors. Interestingly, the share of jobs held by women -- in all three major sectors -- is *higher* in low-income counties, compared to the affluent quartile. This sharply conflicts with the fact that child-care availability is *lower* in these very same counties where maternal labor force participation is greater overall. This gap appears to be greatest in working-class counties where a greater proportion of women are employed in semi-skilled sales and service jobs.

Regional Differences in Child-Care Availability

Next we estimate regional differences in child-care supply, based on the county-level data. We report on supply in terms of availability of all preschool organizations, for subsidized programs only, and for the mean number of child class-groups operating. These regional estimates are built from the universe data collected by Kisker et al. (1991) for each county, weighted to achieve closer representativeness. Note that these region-level estimates stem only from the counties drawn in each region; these regional estimates could be different if based on a greater number of counties.

Table 2 reports supply estimates after sorting counties into strict geographical regions, such as those reported in Kisker et al. (1991). In addition, we report weighted means for an adjusted sorting of counties into regional groupings that more closely share similar economic and social characteristics. Most importantly, Kisker and colleagues included the District of Columbia and Maryland counties in the South grouping. These local areas, however, are more similar to the Northeast demographically and in terms of their political environs; they have very high levels of child-care availability and thus shifted upward Kisker's supply estimates for the South.[5]

The total number of child-care organizations per 1,000 children is greatest in Northeastern and Southern counties (6.0 and 6.1 organizations, respectively), when using a conventional sort into geographic regions. Overall supply levels are distinctly lower in the Midwest (3.9) and West (4.1). Under the adjusted regional groupings, a more significant supply gap becomes apparent between the Northeast (6.4) and South (5.8). Regional differences are greater when we focus on the mean number of *subsidized* preschools per 1,000 children in families living below the poverty line. For the adjusted regional groupings, we observe 16.1 organizations in the Northeast, 15.8 in the Midwest, 13.1 in the South, and 11.1 in the West. These disparities are similar when looking at the mean number of child classes available in each region.

Relatively low supply levels observed in the West are largely explained by low levels reported in California's largest urban counties. For instance, Los Angeles, Orange, and San Diego counties have fewer than 4 preschools per 1,000 children. Outside these urban areas lay rural counties which also manifest relatively low preschool availability. This is in part due to the lower propensity of Latino families to use formal child-care programs; 60 percent of the nation's Latino population lives in the West.

Supply disparities linked to county wealth also occur within certain regions of the country. Figure 1 shows, for example, that about 55 class-groups operate for every 1,000 children, age 3-5, among the most affluent half of sampled Northeastern counties, versus just 31 class-groups in the poorest half (weighted means). A similar pattern is evident in the South. However, supply levels are more similar between affluent and lower-income counties in the West.

Predictors of County-level Child-Care Availability

We constructed preliminary models of child-care availability among the 100 sampled counties. This exercise aimed to identify factors that help to explain variability in child-care supply. At this stage -- both for Study 1 and Study 2 -- we are not claiming that these factors operate as *a priori* causes of preschool availability, since a subset of these predictors may result from, not simply be antecedent to, the supply of preschools. Table 3 reports our reduced regression model of supply per 1,000 children, age 3-5. Initial models were constructed for each of three sets of factors: labor force structure (4 predictors), family structure (4 predictors), and government size and subsidies (7 predictors) pertaining to each of the 100 sampled counties. These preliminary models leading to the reduced specifications are detailed in an earlier report (Fuller and Liang, 1993). The reduced model in Table 3 contains those possible predictors that were statistically significant ($p<.05$ or stronger) in the earlier models.

The proportional size of a county's professional and technical labor force is a strong and consistent correlate of child-care availability. However, the only bivariate association with *maternal* labor participation and preschool supply pertains to the share of manufacturing jobs held by women, and these tend to be quite different types of counties: those with large professional job sectors have small manufacturing sectors. Mean family size within a county is consistently and *negatively* associated with supply: counties dominated by poor or working-class residents possess more constrained supplies of child care centers. Parents' school attainment, entered in the third model (columns 3 and 6) is significantly related to the supply of all centers, but not for subsidized centers. The size of the professional job sector is highly correlated with parental school attainment, so they

were not entered into the same regression model. We also examined possible curvilinear effects from both the professional labor-share predictor and from mean family income. But neither first nor second-degree polynomial terms were significant. The level of aggregation may be too great to detect curvilinear relationships which do appear at the zipcode level for Massachusetts (Study 2 below).

Table 4 reports multivariate models for the supply of child class-groups. Findings are similar. The association between maternal labor participation in manufacturing diminishes for the first two models which pertain to class-groups for children, age 3-5 (columns 4 and 5). Other predictors remain strongly related to class-group availability, whether the maternal-workforce variable remains influential or not, suggesting that any endogeneity operating is not severe. The divorce rate is positively associated with higher class-group availability. Interestingly, county-level divorce rates are not collinear with mean household income (r=.04) nor with the share of African-American residents (r= -.10). Several possible correlates of child-care supply proved *not* to be significantly associated when placed in this regression framework: maternal workforce participation in professional, technical, and service sectors; African-American or Latino representation in the county; and overall government size.

Summary of Study 1

Child-care and preschool organizations are not distributed evenly across regions of the country, nor among local communities. Per capita availability varies systematically and inequitably, based on the affluence and education of parents residing in a particular county. Some analysts argue that these disparities result from differing family preferences and patterns of expressed demand. Indeed, lower levels of preschool supply in the West may be partially explained by high numbers of Latino families who have a lower propensity to utilize formal preschools. Also working-class and rural counties, dominated by larger families, display lower levels of availability.

Sharp variability in household income, even when aggregated to the county level, is clearly associated with preschool availability. Counties with higher median income and greater concentrations of well-educated, professionally employed parents benefit from more robust child-care markets. For these affluent areas the preschool market displays vitality and responsiveness to rising parental demand. But in low-income and working-class counties, families can not afford to pay high fees and many remain ineligible for government subsidies. Here the child-care market's response is much more constrained.

This leads to the question of whether assertive government action can efficaciously reduce inequities linked to family income and social-class stratification. Positive policy

effects are suggested by higher child-care availability observed in northeastern states -- where state governments have subsidized the preschool sector more heavily.

To see whether progressive policy action can equalize child-care supply for low-income families, including those on welfare, we conducted a second study focusing on local neighborhoods within Massachusetts. By studying child-care availability only at the county level we can not spot disparities that may exist among smaller neighborhoods *within* counties. To understand supply patterns within low-income communities -- where most welfare recipients reside -- we must dig deeper into their local neighborhoods.

STUDY 2: VARIATION IN CHILD-CARE AVAILABILITY ACROSS RICH AND POOR MASSACHUSETTS NEIGHBORHOODS

Do poor and working-class families have more equal access to child-care centers within relatively affluent states that have invested more heavily in preschooling? Do disparities in supply persist in communities with high concentrations of welfare recipients? The national study reveals that low-income households, many dependent upon welfare, reside in communities with limited supplies of child-care programs. But is the picture any brighter in an urban state which has attempted to boost availability, particularly for families on AFDC? These basic questions led to our study of Massachusetts neighborhoods.

Massachusetts provides a strong case for assessing whether levels of inequality may diminish under aggressive policy activity in the child-care field. The Commonwealth of Massachusetts spends more on child care and preschooling than any other state in the country. State government appropriations are estimated at $166 million, compared to California's $370 million in spending and New York's $103 million (National Governors, 1990). Massachusetts also enforces one of the toughest set of quality regulations in the country, according to the Children's Defense Fund (Adams, 1990). This assertive regulatory posture can be interpreted as an indicator of state strength in the sector, or as a set of policies that might constrain supply, given possible cost implications of tighter regulation.

Moving beneath the county level to study one particular state carries two advantages. First, counties can be large and heterogenous units. Communities demarcated by zipcodes are more homogenous and better approximate the locale within which families attempt to locate child-care services. Second, the degree of inequality may vary systematically among states, nested within and conditioned by varying policy regimes, regulations, and

subsidy structures. Initial work is mixed on the question of whether state regulation of child care makes a difference in constraining the market's ability to expand, in raising quality, or in reducing inequities (Gormley, 1991; Hofferth & Wissoker, 1991; Fuller et al., 1993). We would expect, however, that variability in supply -- at least differences linked to family and community wealth -- would be less in a state like Massachusetts which has historically supported the expansion of child-care organizations that serve low-income neighborhoods.

Data and Method of Estimation

To study community-level variation in child-care availability we obtained data on licensed or registered centers and preschools from the Massachusetts Office for Children (OFC, 1994) for all zipcode areas within the state. To the child-care data we matched 1990 census information, pertaining to mean household income, welfare participation, adult education levels, and ethnicity (Bureau, 1993). As in Study 1, we express availability in terms of the number of preschool organizations operating per 1,000 children, both for preschool-age children age 3-5, and including infant and toddler programs (where the 0-5 year-old cohort becomes the denominator). The OFC also collects information on licensed child capacity for each preschool, that is, the maximum number of children that can be served. Data on the number of class-groups were not available.

Can Government De-link Child-Care Access from Neighborhood Wealth?

Mean levels of child-care availability across the 368 Massachusetts zipcode areas, for which complete data were available, are reported in Table 5. The first supply indicator is directly comparable to that used in Study 1: the number of child-care organizations per 1,000 children, age 3-5 years. Massachusetts exhibits much higher availability per child: for middle-income communities (row 2) 10.3 preschool or child-care centers are available within the average zipcode area, versus just 5.7 nationwide. This difference is due not only to higher levels of government subsidy. Mean family income and parental education levels are higher for Massachusetts residents, relative to the country as a whole. In turn these factors are associated with higher parental demand for formal child care in middle-class and affluent neighborhoods.

Table 5 also reports economic and demographic features of the zipcode areas, similar to factors that possibly drive supply examined in Study 1. One initial question is whether preschool supply in Massachusetts is as strongly related to community wealth as we saw in the nationwide analysis. We sorted zipcodes into quartiles, identifying those with high-to-low concentrations of poor families (households with earnings below $20,000). We see

that 10.8 preschool organizations operate in communities with the greatest concentration of low-income families (row 1). The mean number of child spaces available in these poor communities (for kids, age 3-5 years) equals 305.9 per 1,000. When we include child-care centers serving toddlers and infants (and use the age 0-5 age cohort as the denominator), the average number of spaces declines to 170 child spaces per 1,000 youngsters.

An interesting pattern emerges when we move to row 2, focusing on zipcode areas with the largest concentrations of working-class and middle-income families (household income between $20,000-$40,000). Among the 75th percentile of these communities, all three indicators of supply fall *below* levels observed among the most impoverished zipcode areas (10.3 preschools and 273.4 child spaces on average). Then, in row 3 we focus on the top quartile of zipcode areas in terms of having the greatest concentration of affluent households (averaging over $75,000 in yearly income). Child-care availability is clearly highest in these wealthy communities: 12.1 preschools and 392.4 child spaces on average, again observed across all three supply indicators.[6]

Two additional facets of these local communities are reported in Table 5. Neighborhoods with high concentrations of welfare recipients possess fewer preschools relative to all low-income neighborhoods (which include working-poor and working-class families and individuals). The top 10 percent of all zipcode areas in terms of having the greatest share of welfare recipients have just 8.3 preschools operating and 298.8 child spaces (row 7). This disparity is even worse for communities with large proportions of single-parent families, including such households from all social classes regardless of income level. They exhibit just 7.4 preschools and 257.7 child spaces (row 5). Thus single mothers with the least amount of social support and greatest need reside in communities that possess the lowest levels of child-care availability.

Table 5 also shows that the average number of child-care centers and preschools is lower, but not the number of child spaces, in zipcode areas containing high concentrations of ethnic minorities. The number of child-spaces is lower in communities with the highest concentration of Hispanics with limited English proficiency, possessing child slots 15% below the statewide average (row 10).

Parental Education and Unequal Availability

Figure 2 illustrates the positive relationship between parents' education and child-care availability. We focus on the proportion of adults with a high school diploma or less (the lowest school-attainment level reported in the census). Supply is generally lower in those neighborhoods with the highest proportions of less-educated adults. In the lowest quintile (with least educated adults), 8.0 preschool organizations operate and provide 260.8 class-

groups. In the highest educated quintile of zipcode areas,12.8 preschools and 396.8 class-groups are available on average. This linear relationship is consistent with our national findings in Study 1 and further corroborated by recent household-level studies (Hofferth, 1991; West et al., 1993).

In Massachusetts the association between parental education and child-care supply operates somewhat independently of family income. That is, availability steadily declines in neighborhoods with less well-educated families. Whereas for communities with low income, targeted subsidies partially offset the otherwise lower availability found in these impoverished neighborhoods.[7]

Influential Predictors of Child-Care Availability

We constructed regression models to assess which of these economic and demographic factors are most influential in driving child-care availability among Massachusetts neighborhoods. Table 6 reports alternative models for estimating the number of child-care organizations and spaces per 1,000 children, including all zipcode communities, then excluding cases where supply values exceed one standard deviation from the mean. This helps to ensure that findings are not sensitive to particular values.

These regressions confirm that income alone, as a linear determinant, is not an influential predictor of child-care availability. Terms for squared and cubed levels of the zipcode's median family income were entered as predictors to assess the strength of the curvilinear relationship detected above (the working and middle-class dip in supply). Dummy predictors for concentrations of working-class and middle-income families also were entered. We do observe a significantly *negative* association between concentration of middle-income families and available child spaces; the coefficient for working-class concentration is negative but not statistically significant (column 4).

Supply is consistently *lower* in communities with high concentrations of single-parent households, after controlling on all other factors. This is partially explained by higher supply levels within affluent zipcodes, dominated by two-parent families. But nationwide we saw that single parents demand more preschool spaces, not fewer. This finding in the Massachusetts context is cause for concern. It suggests that where single-parent families are not participating in welfare programs, child-care capacity remains relatively low. It also suggests that cuts in subsidies for single parents will lower their purchasing power, and thus the supply of child-care programs in their communities.

The strong and positive relationship between parental education and child-care supply remains, even after taking into account the effects of family income. Along this

dimension, availability continues to be unfairly distributed in a basic linear pattern -- supply levels fall as parental education levels decline.

Summary of Study 2

Massachusetts represents a success story in part. The distribution of child-care organizations has been partially uncoupled from the relative wealth of local communities. The targeting of welfare benefits on low-income neighborhoods has spurred greater availability. By loosening the cost constraint facing poor families, targeted benefits have allowed higher levels of expressed demand and, in response, rising supply. While variability in parents' *a priori* preferences for preschooling (versus less formal types of child care) may play a role, Government has succeeded somewhat in responding to pent-up parental demand for preschool services in ways that have equalized supply and access.

Three sources of inequality, however, do persist in the case of Massachusetts:

- Communities with greater shares of single-parent families display lower levels of child-care availability, even after taking into account the positive effect of welfare benefits. These include counties with high concentrations of single-parent families who are not taking full advantage of welfare subsidies and working-class mothers who do not qualify for subventions. The good news is that welfare benefits are related to higher availability of child-care programs; the bad news is that when subsidies are not available, supply lags behind and reinforces unequal access to preschooling for the children of single mothers.

- More highly educated parents demand more preschooling for their children -- and the market of providers responds by raising supply in their affluent communities. The market is less robust and less responsive within communities dominated by low-income and working-class families. Suggested cuts in welfare and child-care funding would inevitably erode current levels of child-care supply -- unless *targeted* specifically on families in low-income communities. The extent to which state governments target child-care support on impoverished communities varies considerably.

- Child-care availability is lower in working-class and middle-income communities overall. This includes families that have difficulty paying private preschool fees and most can not qualify for child-care subsidies. This holds implications for the Clinton Administration's efforts to help the working-poor, families with children who are struggling to stay employed and off of welfare. Unless this source of inequity is addressed, many working-poor parents may be forced to go on the welfare rolls. Child-care access remains greatest, by far, in affluent communities.

POLICY IMPLICATIONS: TARGETING RESOURCES TO REDUCE INEQUALITY

Historical studies of why and how school organizations expand typically arrive at a crucial question: How does family-level demand for more schooling *interact* with policy initiatives to spur greater supply? This reciprocal relationship is an important element in how we interpret the contemporary sufficiency of child care availability. If one looks only at existing capacity, and contrasts it with actual enrollments, unused child spaces are observed in some local areas (Kisker et al., 1991).

Our results, however, confirm two findings from earlier research: First, more affluent and well-educated parents exercise their purchasing power to demand (and finance) a rich supply of child-care and preschool programs. Second, low-income families, when awarded greater purchasing power via targeted subsidies, express greater demand for preschool programs. This latter process is so forceful that in states like Massachusetts child-care availability has been partially de-linked from a community's level of wealth, although access is still lower in communities with high concentrations of welfare recipients.

Congressional debate over welfare reform focuses on reducing AFDC benefits -- a move that would erode the purchasing power of low-income single mothers. We have already seen the real dollar value of welfare benefits decline over the past decade in many states. This has long term consequences for the number and quality of preschools that can be supported within impoverished communities. The unequal levels of availability we observe in the poorest sections of Massachusetts will certainly worsen if Washington and state governors move to reduce AFDC benefits *and* cut child-care subsidies targeted on these families.

Renewed interest in providing block-grants to the states for welfare raises questions over whether targeting aid on poor families might be watered-down. Targeting has efficaciously helped to equalize child care access. This progress could be reversed if Washington loses authority to further reduce persisting levels of inequality.

Recent work points to a possible dip in the availability of child care for working-poor and working-class families (Whitebook et al., 1989; Phillips et al., 1994). Study 2 confirms this claim even in the progressive Massachusetts context: working-class and middle-income communities have significantly lower availability, relative to affluent communities.

We need to better understand whether some working-class parents prefer to place their

children in less formal child-care settings, rather than organized preschools (e.g., Zinsser, 1991), which in turn limits growth in supply. Recent nationwide surveys show that preschool utilization rates travel a flat plateau before rising among affluent households (West et al., 1993). But a dip in participation, falling from poor to middle-income families, is not apparent overall. More work is required to see whether this much-discussed dip (evident in Massachusetts) is experienced by particular ethnic groups or working-class families residing in other states which may be characterized by weaker policy involvement.

A related and slippery issue: How severe are these supply inequities relative to policy concern over the mixed *quality* of preschools and child-care centers? If the steady rise in targeted subsidies is *generally* reducing child-care shortages in some poor communities, should policy makers shift their attention to the quality issue? Caution is warranted: inequalities in basic availability persist, especially in states with sizable low-income, working-class, and rural communities, and where state and local governments have moved slowly to target subsidies and reduce inequality. In addition many child care activists are advocating imprecise ways of expanding the child care system, such as "full funding" for Head Start -- which would drive-out many independent nonprofit preschools and family day-care providers.

Other activists are deemphasizing supply issues and moving to the quality issue -- a risky path given the surge in demand that will come if aggressive welfare reform and workfare requirements are approved by the Congress and state legislatures. More precise identification of where access disparities exist would help reduce inequalities and help to conserve scarce resources so necessary for improving quality.

Finally, nationwide interest in advancing "school readiness" will simply reinforce children's unequal performance in the early grades until we address institutionally structured inequality at the preschool level. The troubling fact about untargeted expansion of preschool programs is that the system will always respond well to rising demand exercised in affluent neighborhoods. Yet cuts in welfare spending, unless offset by greater support of child care within poor neighborhoods, will result in less purchasing power and, in turn, further erode child-care access in these communities.

Until remaining inequalities in basic availability are addressed, many families will continue to have difficulty finding child care. And as long as the most affluent and best-educated families exploit a richer preschool market, their children will begin school far ahead, relative to poor and working-class youngsters. The market alone will not reduce such relentless forms of inequality -- nor will imprecise, untargeted intervention by Government.

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Endnotes

1. We use the terms *child-care center* and *preschool* synonymously. The earlier distinction between "custodial" day care and educational preschools has blurred considerably. Both studies on which we report in this paper deal only with formal centers and preschools, including Head Start, public school based centers, church run, independent non-profit and for-profit preschool organizations. We have excluded centers serving school-age children (after school programs), as well as home-based day care. Study 1 includes unlicensed or exempt centers; Study 2 includes centers that must be registered or licensed in Massachusetts.

2. Historical changes in supply are reported by Coelen, Glantz, and Calore (1979), Hofferth (1989), and Willer et al. (1991).

3. Kisker et al. (1991) proceeded to survey 2,089 preschool directors across the sampled counties. They concluded that regional differences in availability are not acute. But this claim was based on their sample of preschools and center-based programs, not based on universe counts. Their finding also did not flow from a study of different weighting schemes, as we discuss below. Effects of regional location on the type of child care selected by families are reported by Duncan and Hill (1977), Leibowitz, Waite, and Witsberger (1988), Hofferth and Wissoker (1992).

4. The 10 most affluent counties laying closest to the 75th percentile: Stanislaus and San Mateo (California), Madison (Indiana), Macoupin and Montgomery (Illinois), Alamance (North Carolina), Columbia and Clatson (Oregon), Philadelphia and Westmoreland (Pennsylvania), and Bexar and Bowie (Texas). The lowest income counties most proximate to the 25th percentile: Maricopa (Arizona), Los Angeles and Ventura (California), De Kalb and Fulton (Georgia), Suffolk (New York), Cuyahoga (Ohio), Bristol (Rhode Island), Harris (Texas), and King (Washington).

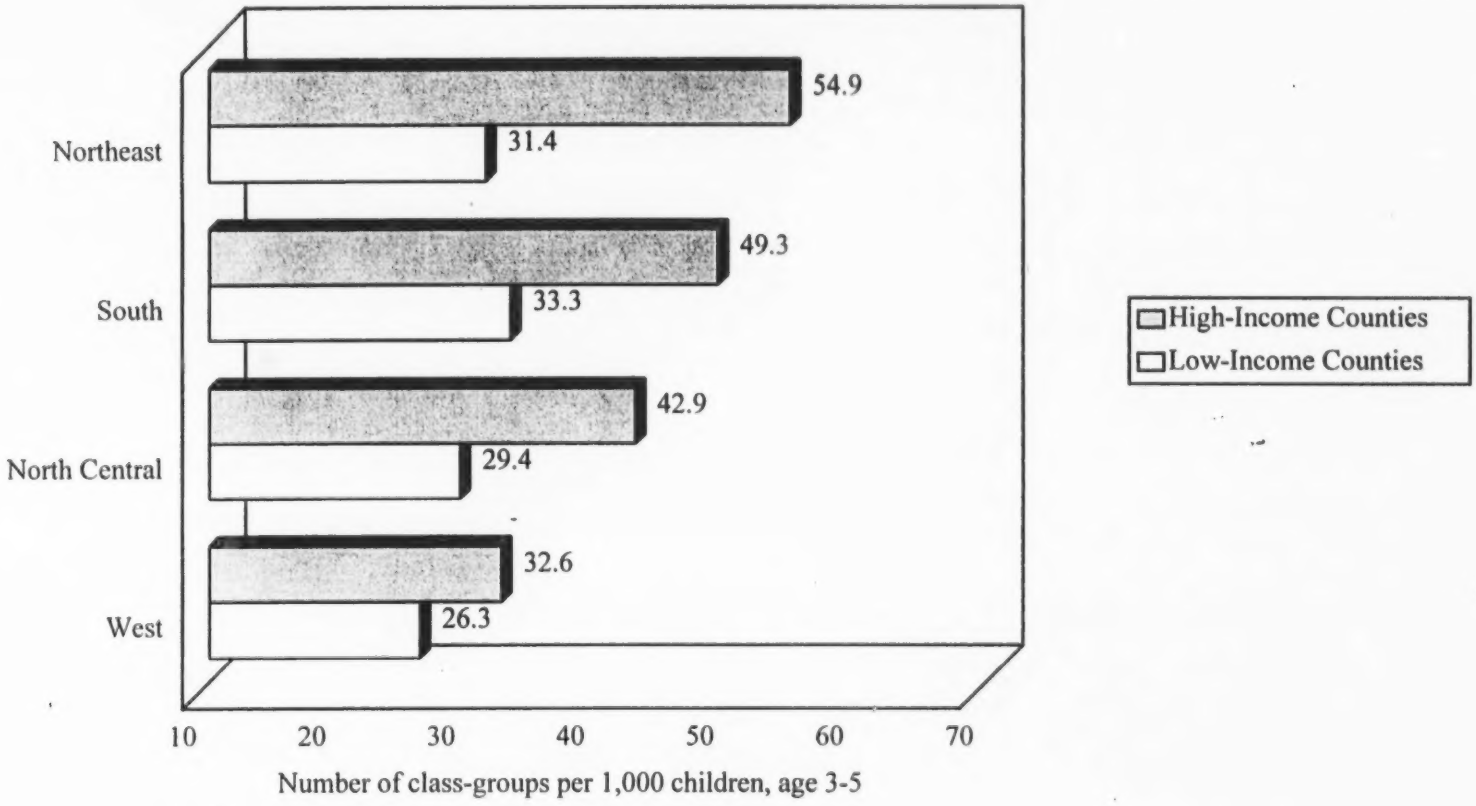
5. In addition, the adjusted regional sort places two Oklahoma counties in the Midwest.

6. Quite high levels of per capita supply are observed in 39 of the 368 zipcode communities. These 39 lay more than one standard deviation above the mean number of organizations per 1,000 children, age 3-5. We re-ran the family income analysis, excluding these high cases. But the pattern remains very similar. Zipcode communities with high concentrations of working and middle-class households display relatively low numbers of preschool places. Affluent zipcodes show the highest supply of organizations and child spaces. Excluding outliers, the average number of preschool organizations per 1,000 children equals 7.7, 7.8, and 9.9 for families earning less than $20,000, $20,000-$40,000, and more than $75,000, respectively.

7. To assess the robustness and linearity of the parent education relationship, we again eliminated observations laying one standard deviation above the per capita mean number of preschool organizations. The linear association is quite similar with an accelerating level of supply observed in the best-educated quintile.

Figure 1: Inequality in Preschool and Child Care Supply by Region

[Supply of class-groups per 1,000 children, age 3-5, for high and low-income counties]



High and low-income designation based on percentage of professional and technical jobs in the county.
Regional samples include 26 counties in North Central; 30 in South; 22 in Northeast; and 21 in West.

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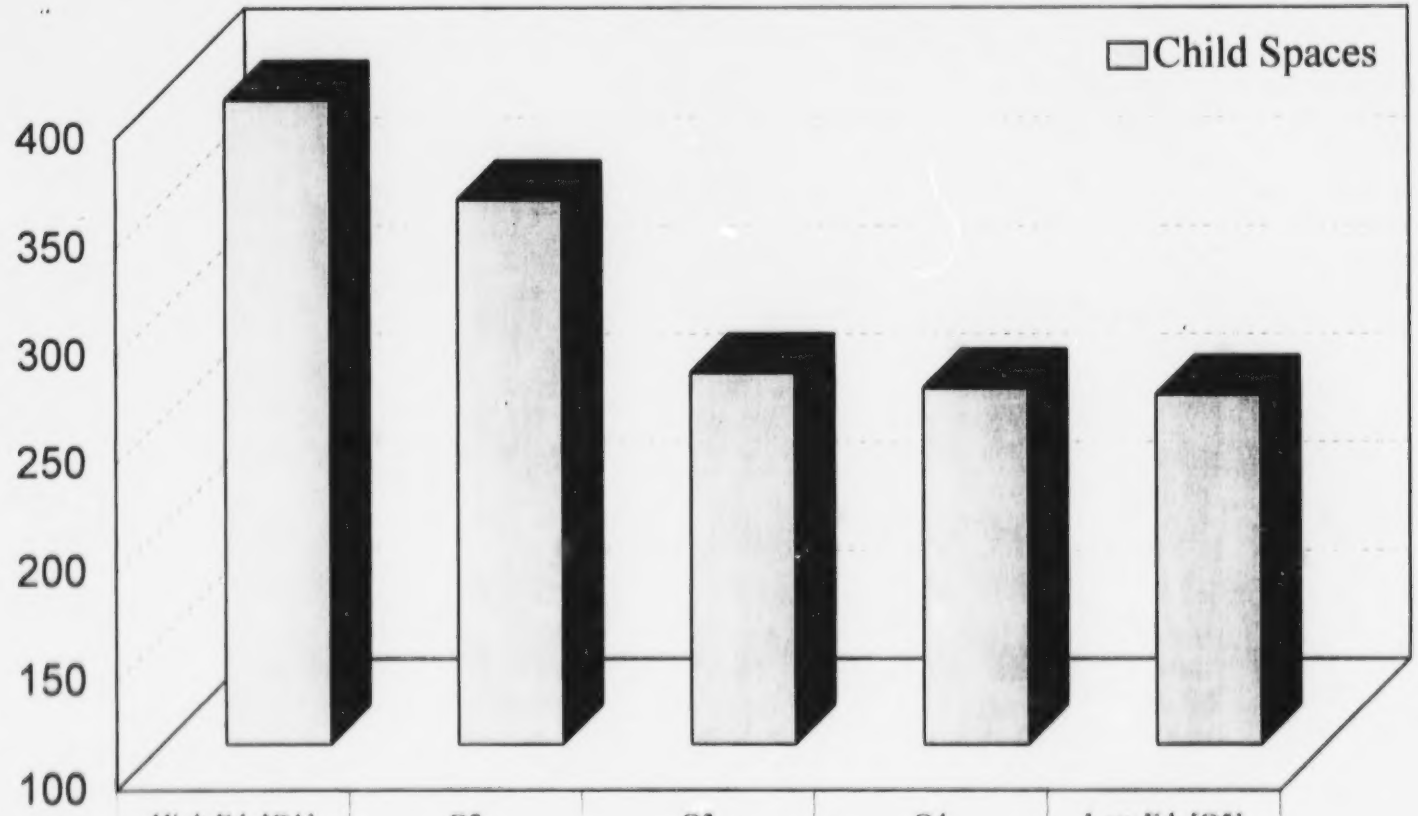
Figure 2

Number of Child Spaces by Parent Education Levels for Massachusetts



	High Ed. [Q1]	Q2	Q3	Q4	Low Ed. [Q5]
Child Spaces	397	351	271	264	261

Note: Number of child spaces in centers and preschools per 1,000 children, age 3-5 years. Figures are average number of child spaces for each of five quintiles, breaking-down Massachusetts zipcode areas by parental education levels.

Table 1

Availability of Preschools and Child-Care Centers Nationwide and Possible Correlates by County-Income Quartiles[1]

[n=100 counties, means and SD in parentheses]

	All Counties	Low Income Counties [25th percentile]	High Income Counties [75th percentile]
Supply Indicators[2] [per 1,000 children, age 3-5]			
Preschools and child-care centers	5.7 (3.6)	5.0 (1.7)	6.1 (2.8)
Fully subsidized centers	1.8 (1.8)	1.8 (1.1)	1.8 (1.6)
Class groups [all centers, all age groups]	37.5 (24.4)	29.3 (9.9)	41.1 (16.9)
Class groups [all centers, age 3-5 years]	20.7 (14.9)	13.4 (4.1)	22.0 (10.4)
Quality Indicators			
Child:teacher ratio, age 3-5 years	12.4 (1.9)	12.0 (1.7)	12.4 (2.4)
Child:adult staff ratio, age 3-5 years	8.5 (1.2)	8.9 (1.2)	8.2 (1.3)
Average number of child groups	4.1 (0.9)	3.4 (0.8)	4.4 (0.9)
Family Income Levels			
Mean family income [$ per capita]	13,156 (3063)	9,565 (1038)	17,318 (2046)
Percentage of households below the poverty line	9.2 (4.8)	13.9 (5.7)	6.6 (3.6)
Labor Structure			
Percentage of workforce employed in professional or technical jobs	20.3 (7.1)	13.8 (4.0)	28.2 (6.2)
Percentage of workforce in semi-skilled sales or service jobs	26.9 (5.5)	22.4 (5.5)	29.9 (3.9)

Table 1 [continued] ...

	All Counties	Low Income Counties [25th percentile]	High Income Counties [75th percentile]
Share of professional and technical jobs held by women	48.8 (3.5)	51.8 (2.8)	45.9 (2.8)
Share of semi-skilled sales and service jobs held by women	65.2 (3.9)	68.2 (3.0)	61.1 (2.8)
Share of manufacture and assembly jobs held by women	38.5 (9.9)	40.7 (13.6)	38.8 (8.1)
Family Structure			
Percentage of all children under 5 years of age	7.4 (1.1)	7.9 (1.0)	6.5 (1.2)
Average number of persons residing in the household	2.6 (0.2)	2.7 (0.1)	2.5 (0.3)
Percentage of households headed by a single mother	10.2 (2.9)	10.6 (3.4)	9.8 (2.5)
Percentage of families, African-American	12.9 (14.1)	16.6 (16.5)	12.7 (14.4)
Percentage of families, Latino	5.8 (9.9)	5.7 (13.4)	7.2 (6.0)

Notes

1. Counties are split into quartiles on the basis of aggregate household income per capita in 1988 (Bureau of the Census 1988).

2. The supply-indicator means in column 3 exclude two (high) outlying counties: Arlington, Virginia and New York City. If these counties are excluded from column 1, the four mean values, reading down, equal 5.3 centers, 1.6 subsidized centers, 35.1 class groups, and 19.2 class groups for children, age 3-5 years.

Table 2

Alternative Regional Estimates of Preschool Availability
[Weighted regional means]

	Northeast	Midwest	South	West
All Preschool Organizations per 1,000 children (5 years of age or less)				
Original regional sort	6.0	3.9	6.1	4.1
Adjusted regional sort[1]	6.4	4.1	5.8	4.1
Subsidized Preschool Organizations per 1,000 children below the poverty line (5 years of age or less)				
Original regional sort	15.1	16.1	13.8	11.1
Adjusted regional sort	16.2	15.8	13.1	11.1
Class-groups for Children age 3-5 per 1,000 children (3-5 years of age)				
Original regional sort	27.8	16.8	21.9	14.9
Adjusted regional sort	28.7	17.1	20.8	14.9

Notes

1. The adjusted sort starts with the strictly geographical regions, then moves the District of Columbia into the Northeast and Oklahoma into the Midwest. These shifts are based on common characteristics and political histories, rather than only geography. The Western region remains unchanged.

Table 3

Regression of Availability of Preschool Organizations on Economic Factors, Family Structure, and Government Actions
[n=98 or 88 counties, β and t statistics reported]

	Y Supply Measures [per child]					
	All Centers			Subsidized Centers		
	[1]	[2]	[3]	[4]	[5]	[6]
Labor Demand						
Percentage of jobs, professional or technical	--	.16 (3.67)***	—	.009	-- (0.35)	
Share of manufacturing jobs held by women	.07 (2.27)*	.07 (2.33)*	.08 (2.60)*	.02 (1.14)	.02 (1.14)	.02 (1.22)
Family Structure						
Family size	-.70 (-4.02)***	-.54 (-3.17)**	-.40 (-2.07)*	-.31 (-3.21)**	-.31 (-3.02)**	1.27 (-2.40)*
Divorce rate	.61 (3.18)**	.59 (3.27)**	.60 (3.24)**	.17 (1.55)	.16 (1.53)	.16 (1.52)
Government Action						
Parents' school attainment	—	.16	— (3.10)**	.02		(0.75)
Child-care subsidy level	.04 (1.55)	.06 (2.78)**	.06 (2.44)*	—		--
Model						
Intercept	-.88	-4.5	-4.2	.16	-.02	-.27
F-value	11.16***	12.82***	11.67***	5.92**	4.43**	4.56**
Adj. r^2	.29	.37	.35	.14	.13	.14

*p<.05 **p<.01 ***p<.001

Note: For models 4-6 complete data were available for 88 counties.

Table 4

Regression of Availability of Preschool Class-Groups on Economic Factors, Family Structure, and Government Action
[n=98 counties, ß and t statistics reported]

	Y Supply Measures [per child]					
	All Child Class-Groups			Class-Groups, Age 3-5		
	[1]	[2]	[3]	[4]	[5]	[6]
Labor Demand						
Percentage of jobs, professional or technical	--	.91 (3.13)**	—	.61	-- (3.44)***	
Share of manufacturing jobs held by women	.45 (2.18)*	.44 (2.09)*	.49 (2.52)*	.24 (1.94)	.23 (1.97)	.27 (2.27)*
Family Structure						
Family size	-5.4 (-4.63)***	-4.4 (-3.89)***	-3.3 (-2.61)**	-3.5 (-4.89)***	-2.8 (-4.09)***	-2.2 (-2.80)**
Divorce rate	4.9 (3.93)***	4.8 (4.02)***	4.8 (4.04)***	2.2 (2.81)**	2.1 (2.86)**	2.1 (2.87)**
Government Action						
Parents' school attainment	—	1.10	— (3.21)**	.69		(3.26)**
Child-care subsidy level	0.04 (0.23)	.20 (1.27)	.18 (1.15)	.14 (1.46)	.25 (2.60)*	.23 (2.40)*
Model						
Intercept	-5.6	-26.1	-28.2	-2.6	-16.4	-16.7
F-value	13.35***	13.64***	13.81***	12.53***	13.54***	13.17***
Adj. r^2	.33	.39	.39	.32	.39	.38

*p<.05 **p<.01 ***p<.001

Table 5

Availability of Preschools and Child-Care Centers in Massachusetts and Possible Correlates

[n=368 zipcodes, means and SD's reported][1]

	Organizations per 1,000	Spaces for 3-5 year-olds per 1,000	Spaces for 0-5 year-olds per 1,000
Household Income in Zipcode Communities			
Zipcodes with highest concentrations:[2]			
1. Families earning < $20,000	10.8	305.9	170.0
	(9.3)	(196.6)	(121.4)
2. Families earning $20,000 - $40,000	10.3	273.4	146.1
	(8.4)	(181.2)	(97.2)
3. Families earning $75,000 +	12.1	392.4	241.3
	(6.7)	(200.4)	(131.7)
High shares of single-parent households:			
4. Highest quartile of zipcode areas	8.1	261.7	148.9
	(6.2)	160.2)	(111.1)
5. Highest decile of zipcode areas	7.4	257.7	155.0
	(6.4)	(183.0)	(139.0)
High share of welfare recipients:[3]			
6. Highest quartile of zipcode areas	9.8	290.5	163.7
	(8.9)	(176.4)	(116.9)
7. Highest decile of zipcode areas	8.3	298.8	172.1
	(8.1)	(207.5)	(141.0)
Ethnicity of Zipcode Communities			
Zipcodes with highest concentrations:			
8. Top decile, African-American	8.8	312.3	187.5
	(6.6)	(215.2)	(162.1)
9. Top decile, Latinos	8.6	313.3	185.4
	(5.9)	(198.5)	(148.2)

Table 5 continued...

10. Top decile, limited English speakers (Latinos)	9.4 (4.4)	292.1 (144.1)	162.7 (76.9)

Notes

1. The denominator for supply indicators in oolumns 1 and 2 equals the number of children, age 3-5 years, residing in the zipcode area. The indicator in column 3 uses the number of children, age 0-5 years.

2. By 'highest concentration' we mean the top quartile of zipcode areas.

3. Households receive $126 per capita in total welfare benefits within the top quartile of zipcode areas. In the top decile, aggregate benefits equal $233 per person.

Table 6

Regression of Preschool Availability in Massachusetts on Economic Factors, Family Structure, and Parental Education (Betas and t-statistics reported)

	Organizations per 1,000 children		Spaces per 1,000 children	
	All zipcodes	Excluding high cases	All zipcodes	Excluding high cases
Economic				
- Median Income	-2.00E-06 (-0.01)	1.29E-04 (0.53)	-3.17E-03 (-0.29)	1.12E-03 (0.12)
- Median Income Square	-3.28E-09 (-0.34)	-3.86E-09 (-0.74)	1.80E-08 (0.07)	-3.51 (-0.18)
- Median Income Cubed	3.44E-14 (0.57)	2.69E-14 (0.81)	5.67E-14 (0.04)	1.30E-12 (0.10)
-Working-class income (dummy)	3.11 (0.18)	-4.78 (-0.53)	-27.3 (-0.07)	-567.9 (-1.75)
-Middle-class income (dummy)	31.7 (1.69)	0.87 (0.08)	-476.9 (-1.04)	-801.4 (-2.08)*
-Welfare payment (median, logged)	6.05 (2.75)**	2.37 (2.03)*	151.4 (2.81)**	139.0 (3.25)**
Family Structure and Demography				
- % Single-parent headed	-71.0 (-3.89)***	-28.6 (-2.98)**	-1.5E3 (-3.50)***	-0.7E3 (-2.23)***
- % Adults only high school diploma	-34.8 (-5.55)***	-19.2 (-5.62)***	-720.2 (-4.68)***	-455.2 (-3.64)***
- % Latino population	10.1 (1.10)	2.9 (0.62)	329.0 (1.45)	61.6 (0.36)

Table 6 continued

Intercept	11.3	11.2	475.1	375.7
F-Statistic	6.26***	7.29***	6.29***	5.60***
DF	9,358	9,319	9,358	9,319
Adjusted R^2	0.11	0.15	0.11	0.11

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix I

Definition of Variables and Indices
(Listed in order of appearance in text and tables)

Variable or Index	Definition and Transformations
Study 1	
▪Preschools per 1,000 children, age 3-5	Total universe of known centers in 1990 for each county per 1,000 children in age cohort.
▪Fully subsidized centers per 1,000	Total universe of known centers operated by Head Start public schools, and share of fully subsidized independent center (the latter from sampled preschools).
▪Class groups for all age groups	Estimated number of classes, regardless of child age, based on sampled preschools and applied to universe data by county and by preschool type.
▪Class groups for children, age 3-5	Estimated number of classes for 3-5 year-olds, based on sampled preschools and applied to universe data by county and by preschool type.
▪Child:teacher ratio, age 3-5	Ratio calculated from sampled preschools, including only lead teachers or staff qualified to teach.
▪Child:adult ratio, age 3-5	Ratio calculated from sampled preschools, including all adult staff members.
▪Mean family income per capita	Directly from Bureau of Census (1988).
▪Percentage of households below the poverty line	Directly from Bureau of Census (1988).
▪Percentage of workforce employed in professional, technical, semi-skilled, or service jobs	Calculated from data provided in Bureau of Census (1993).
▪Maternal employment shares for same job categories	Calculated from data provided in Bureau of Census (1993).
▪Percentage of all children under age 5	Directly from Bureau of Census (1988).

Appendix I continues...

Appendix I continued

Variable or Index	Definition and Transformations
▪Average of number of persons residing in household	Directly from Bureau of Census (1988).
▪Percentage of households headed by a single mother	Directly from Bureau of Census (1988).
▪Percentage families African-American or Latino	Directly from Bureau of Census (1988).
▪Parents school attainment	Directly from Bureau of Census (1988).
▪Divorce rate	Directly from Bureau of Census (1988).
▪Child-care subsidy level	Mean percentage of preschool budget coming from public sources, calculated using sampled preschools.
Study 2	
▪Preschool organizations per 1,000 children, age 3-5 or 0-5 years	Counts by zipcode from Office of Children (1994).
▪Preschool spaces per 1,000 children age 3-5 or 0-5 years	Number of child spaces for which preschools are operated to provide, taken from Office of Children (1994).
▪Family income increments	Means reported by zipcode in Bureau of Census (1993).
▪Percentage households African-American or Latino	Shares calculated from Bureau of Census (1993) by zipcode.
▪Welfare payments	Average cash transfers per capita reported in Bureau of Census (1993).
▪Adult school attainment	Means reported by zipcode in Bureau of Census (1993).
▪Households headed by single parent	Directly from Bureau of Census (1993).